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THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXIV Number 14

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CHECK LIST REVISION

Freeman Weiss

AMYGDALUS

AMYGDALUS COMMUNIS L., ALMOND. Cult. mainly in Growth Regions 3 & 5.

Armillaria mellea (Vahl) Fr., mushroom root rot. Calif., N. C.
Ascospora beijerinckii Vuill. (Coryneum beijerinckii Oud.), blight, shot-hole. Calif., Idaho, Oreg.
Cercospora circumscissa Sacc., shot-hole. Calif., Oreg.
Cladosporium carpophilum Thuem., scab. Calif., Conn., Oreg.
Cytospora marginata McAlpine, on twigs. Oreg.
Glococporium amygdalinum Brizi, anthracnose, kernel rot. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Ariz.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex.
Phytomonas pruni (E. F. Sm.) Bergey, bacterial leaf spot. Nebr.
P. syringae (van Hall) Bergey, bacterial shoot blight. Calif.
P. tumefaciens (E. F. Sm. & Towns.) Bergey, crown gall. Ala., Ariz., Calif., N. C.
Phytophthora cactorum (Leb. & Cohn) Schroet. Calif.
P. citrophthora (Sm. & Sm.) Leonian, die-back. Calif.
Polyporus versicolor (L.) Fr., heart rot. Oreg.
Schizophyllum commune Fr., wound rot. Calif.
Sclerotinia laxa Aderh. & Ruhl., blossom blight, brown rot. Calif., Oreg.
S. sclerotiorum (Lib.) D By., green fruit rot. Calif.
Tranzschelia pruni-spinosae (Pers.) Diet. var. discolor Dunegan, rust. Calif.
Verticillium albo-atrum Reinke & Berth., wilt. Calif., Ill.
Virus diseases:
Calico, undet. virus, ? Prunus virus 5. Calif.
Mosaic, Prunus virus 5 (Hutch.) Smith (Marmor persicae Holmes). Calif.
Susceptible to the following virus diseases as shown by experimental inoculation:
rosette, Prunus virus 2 (McClint.) Smith (Nanus rosettae Holmes);
phony disease, Prunus virus 3 (Hutch.) (Nanus mirabilis Holmes);
yellows, Prunus virus 1 (Kunkel) Smith (Chlorogenus persicae var. typica Holmes).

AMYGDALUS DAVIDIANA (Carr.) Zabel, CHINESE WILD PEACH. Cult. as rootstock and ornamental.

Tranzschelia pruni-spinosae (Pers.) Diet. var. discolor Dunegan, rust. Ga., Tex.

AMYGDALUS NANA L., RUSSIAN ALMOND. Cult. as ornamental.

Cercospora circumscissa Sacc., leaf spot. Kans.
Phyllosticta virginiana (Ell. & Halst.) Seaver, leaf spot. Mont.

AMYGDALUS PERSICA L., PEACH. Cult. in Growth Regions 1,2,3,5,6,7,8, 10,19,20,22,24,25,27,28,29.

Armillaria mellea (Vahl) Fr., mushroom root rot. Cosmopolitan.
Ascospora beijerinckii Vuill. (Coryneum beijerinckii Oud.), blight, winter blight, pustular spot. General, especially in Western States.
Aspergillus niger van Tiegh.; black mold fruit rot. Cosmopolitan.
Botryosphaeria ribis var. chromogena Shear et al. Fla., Ga.
Botrytis cinerea Pers., gray mold fruit rot. Cosmopolitan.
Caryospora putaminum (Schw.) DeNot., on pits. Widespread.
Cephalothecium roseum Cda., pink mold fruit rot. Widespread.
Cercospora circumscissa Sacc., shot-hole. General.
C. consobrina Ell. & Ev., leaf spot. Ill., La.
(Cercosporella persica Sacc.): Mycosphaerella persica.
Choanephora persicaria Eddy, fruit rot. N.Y. (market).
Cladosporium carpophilum Thuem., scab. General.
Clitocybe monadelpha (Morgan) Sacc., root rot. Ark., Fla., Mo., Okla.
C. tabescens Berk., root rot. Fla.
Commandra pallida DC., on roots. Wash.
Coniothyrium sp., twig blight. Tex.
Cornularia persicae (Schw.) Sacc., on branches. Central and Southern States.
(Coryneum beijerinckii Oud.): Ascospora beijerinckii.
Cytella marginata McAlp., twig blight. Oreg.
(Cytospora cincta Sacc. and C. leucostoma Sacc.): Valsa cincta and V. leucostoma.
C. persicae Schw., on twigs and branches. Conn. and N. Y. to S. C., Miss., and Ariz.
Diplodia natalensis Pole-Evans (pycnidial stage of Physalospora rhodina (Berk. & Curt.) Cke.), gumming disease. Ala., Fla., Tex.
D. persicina Grove, on branches. La.; Pa.
Fabraea maculata (Lév.) Atk. (Entomosporium maculatum Lév.), leaf blight. Calif., N. J.
Fomes applanatus (Pers.) Gill., white mottled rot. Conn., N. J.
F. connatus (Weinm.) Gill., white spongy rot. Conn.
F. pinicola (Sw.) Cke., brown crumbly rot. N.C., Oreg.
F. roseus (Fr.) Cke., brown pocket rot. Oreg., W. Va.
Fumago vagans Pers., fruit stain. Cosmopolitan.
Fusarium spp. F. avenaceum (Fr.) Sacc., F. orthoceras App. & Wr., and F. solani (Mart.) App. & Wr., fruit rot, in Calif., Ill., N.C., Texas; F. lateritium Nees and one or more of the preceding spp., bud rot, and twig blight, in Calif., Ga., Kans.

AMYGDALUS PERSICA -- Continued.

Fusicoccum persicae Ell. & Ev., on twigs, ? die-back. Ga., La., Pa.
Ganoderma curtisii Berk., root rot. N.C., Va.
Gloeodes pomigena (Schw.) Colby, on branches. Ind.
Glomerella cingulata (Ston.) Spauld. & Schrenk., ripe rot, twig blight. Occasional.
Haplosporella amygdalina Dearn. & Barth. Kans.
(Helminthosporium carpophilum Lev.): Ascospora beijerinckii.
Heterodera marioni (Cornu) Goodey, root knot. N.C. to Kans., Fla. to Calif.
Lenzites sacpiaria Fr., heart rot. Oreg.
Leptothyrium pomi (Mont. & Fr.) Sacc., on twigs. Ind., Wash.
Macrophoma persicina (Berk. & Curt.) Berl. & Vogl., on branches. Mo., Pa.
Monilia, Monilinia. See Sclerotinia.
Mycosphaerella persica Higgins & Wolf (Cercosporella persica Sacc.), frosty mildew. Widespread.
Nectria cinnabarina (Tode) Fr., twig blight, canker. Ala.
Oidium. See Podosphaera and Sphaerotheca.
Phoma persicae Sacc., stem canker. Eastern & Southern States.
Phyllosticta circumscissa Cke., leaf spot. Widespread.
P. persicae Sacc., leaf spot. Md., Nebr., Ohio.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., N. Mex., Tex.
Physalospora fusca Stevens, on branches. Southern States.
P. obtusa (Schw.) Cke., on branches. Eastern & Southern States.
Phytomonas pruni (E. F. Sm.) Bergey et al., bacterial leaf spot, black spot. Eastern, Central, and Southern States, incl. Texas.
P. syringae (van Hall) Bergey et al., bacterial shoot blight, bacterial gummosis. Calif., Oreg.
P. tumefaciens (E. F. Sm. & Towns.) Bergey et al., crown gall. General.
P. rhizogenes Riker et al., hairy root. Central States.
Phytophthora cactorum (Leb. & Cohn) Schroet., stem canker. Ark., Calif.
P. citrophthora (Sm. & Sm.) Leonian, crown canker. Calif.
Podosphaera oxyacanthae (DC.) D By., powdery mildew. General.
Polyporus → P. hirsutus (Wulf.) Fr., sapwood rot. Cosmopolitan.
see #356
P. lacteus Fr., sapwood rot. N.C.
P. versicolor (L.) Fr., sapwood rot. Cosmopolitan.
Rhizoctonia solani Kühn, damping-off. Ark., Conn.
Rhizopus nigricans (Ehrenb.) ex Fr., fruit rot. Cosmopolitan.
Schizophyllum commune Fr., wound rot. Cosmopolitan.
Sclerotinia fructicola (Wint.) Rehm, brown rot, canker. General.
S. laxa Aderh. & Ruhl., brown rot, twig & blossom blight. Pacific Coast States.
S. sclerotiorum (Lib.) D By., blossom blight, green fruit rot. Calif.

AMYGDALUS PERSICA -- Continued.

Sclerotium rolfsii Sacc., stem rot of seedlings. Southern States.
Sphaeropsis spp. See Physalospora.
Sphaerotheca pannosa (Wallr.) Lév., powdery mildew. General.
Stereum hirsutum (Willd.) ex Fr., wood rot. Crog.
S. purpureum Pers., silver leaf. Occasional.
Taphrina deformans (Berk.) Tul., leaf curl. General.
Tremetes subrosea Weir, brown pocket rot. Crog.
Tranzscheliа pruni-spinosae (Pers.) Diet., var discolor Dunegan, rust. General.
Valsa cincta Fr. and V. leucostoma (Pers.) Fr., die-back, canker. Widespread, especially in Eastern and Central States.
Verticillium albo-atrum Reinke & Berth., wilt. Occasional, Northeastern States.
Chlorosis. Chiefly iron and magnesium deficiency associated with alkaline soils. Southwestern States.
Gummosis. Various causes, chiefly environmental, as winter injury and bad drainage; also twig- and bark-infecting fungi.
Little leaf. Zinc deficiency. Calif.
Virus diseases:
Asteroid spot, undet. virus. Calif.
Leaf-casting yellows. Undet. virus, possibly yellow-red virosis. Calif., Idaho.
Leaf curl and shot-hole, undet. virus, possibly yellow-red virosis. Wash.
Little peach, Prunus virus 1A Smith (Chlorogenus persicae var. micropersica Holmes). Conn. to Mich., Ohio & Kans., S. C. to Tenn. and Mo.
Mosaic, Prunus virus 5 (Hutch.) Smith (Marmor persicae Holmes). Okla. and Texas to Calif., Colo. & Utah. A different type of mosaic, or ring-spot, occurs on nursery peaches in Ky., and others, not clearly differentiated, on bearing trees in Calif.
Phony disease, Prunus virus 3 (Hutch.) Smith (Nanus mirabilis Holmes). Southeastern and Southern States west to Mo. & Tex.
Red suture, Prunus virus 4 (Bennett) Smith (? Chlorogenus persicae Holmes). Mich., Md.
Rosette, Prunus virus 2 (McClint.) Smith (Nanus rosettae Holmes). S. C. to Fla., Tenn. & Miss.; Michigan to Ark. & Okla.
Yellow-red virosis, Prunus virus --? (Marmor lacerans Holmes). Conn., Mass., N.Y., possibly Idaho & Pacific Coast States.
Yellows, Prunus virus 1 (Kunkel) Smith (Chlorogenus persicae var. typica Holmes). Eastern, Central, and Southeastern States to S. C. & Texas.

AMYGDALUS PERSICA L. var. NECTARINA Ait., NECTARINE. Cult. mainly in Calif.

Ascospora beijerinckii Vuill., shot-hole. Calif., Wash.
Cladosporium carpophilum Thuem., scab. Conn., Del., Ill., N. Y.
Heterodera marioni (Cornu) Goodey, root knot. Calif.

AMYGDALUS PERSICA var. NECTARINA -- Continued:

Phytomonas pruni (E. F. Sm.) Bergey et al., bacterial leaf spot. Okla.
Podosphaera oxyacanthae (DC.) D By., powdery mildew. Idaho, Wash.
Sclerotinia laxa Aderh. & Ruhl., brown rot. Calif., Wash.
S. fructicola (Wint.) Rehm, brown rot. Conn., N.Y., Texas.
Sphaerotheca pannosa (Wallr.) Lév., powdery mildew. N.Y., Oreg.
Taphrina deformans (Berk.) Tul., leaf curl. Wash.
Valsa leucostoma (Pers.) Fr., canker. D.C.
Virus diseases:
Rosette, Prunus virus 2 (McClint.) Smith (Nanus rosettae Holmes).
Yellow-red virosis, Prunus virus --? (Marmor lacerans Holmes).
Yellows, Prunus virus 1 (Kunkel) Smith (Chlorogenus persicae var. typica Holmes).

(Division of Mycology and Disease Survey, U. S. Bureau of Plant Industry).

VERTICILLIUM WILT OF ELM

E. G. Kolshoiner and C. May

Among the wilt-producing fungi isolated from elm specimens submitted to the Department of Agriculture because they were suspected of being attacked by the Dutch elm disease, caused by Ceratostomella ulmi, Verticillium sp. ranked third. It was surpassed only by C. ulmi and Dothiorella ulmi, the cause of a die-back of elm.

Verticillium wilt is not a new disease by any means, but it attracted more attention in this country with the appearance of the Dutch elm disease. Its prevalence and wide distribution indicate that it is serious enough to be considered an important elm disease, affecting about 5 percent of the total specimens received at the Dutch elm disease laboratory.

The cases of Verticillium reported annually for the years following 1933 (when the scouting for the Dutch elm disease was concentrated in New Jersey, New York, Connecticut, and Pennsylvania) suggest that the disease may be as prevalent in other States in which the American elm is a common tree.

Verticillium has been isolated from elm specimens submitted from 33 States, extending from Oregon eastward to Maine and from Minnesota south to Louisiana (see Table).

ELM SPECIMENS YIELDING VERTICILLIUM, 1930 to 1938, by STATES

STATE	1930		1931		1932		1933		1934		1935		1936		1937		1938		TOTAL	
	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.	Spec. cult.	No. Vert.
Alabama	-	0	-	0	-	0	-	0	7	0	-	0	2	0	4	0	20	1	33	1
Arizona	-	0	-	0	-	0	-	0	-	0	-	0	-	0	4	1	-	0	4	1
Arkansas	-	0	2	0	-	0	1	0	-	0	-	0	2	0	3	0	5	1	13	1
California	-	0	2	0	-	0	-	0	3	0	-	0	-	0	-	0	-	0	5	0
Colorado	-	0	-	0	3	0	-	0	4	1	3	2	-	0	-	0	-	0	10	3
Connecticut	1	0	2	1	4	2	72	6	2015	177	9810	315	11705	494	7752	155	10898	1020	42259	2170
Delaware	-	0	-	0	-	0	4	1	5	0	4	2	13	0	1	0	5	0	32	3
Florida	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
Georgia	-	0	-	0	-	0	1	0	1	0	-	0	2	0	1	0	7	2	12	2
Idaho	-	0	-	0	-	0	1	0	-	0	-	0	-	0	-	0	-	0	1	0
Illinois	5	1	19	3	5	1	10	1	18	1	215	138	425	111	79	15	40	9	816	280
Indiana	3	0	4	1	3	0	5	0	73	4	140	63	198	61	3190	668	7908	2435	11524	3232
Iowa	-	0	1	0	4	0	55	2	5	0	7	0	4	1	5	0	4	1	85	4
Kansas	-	0	-	0	2	0	2	0	4	0	-	0	-	0	1	0	3	1	12	1
Kentucky	-	0	1	0	2	0	10	0	18	0	75	4	71	4	76	11	282	20	535	39
Louisiana	-	0	-	0	-	0	5	1	5	0	13	5	12	0	1	0	1	0	37	6
Maine	1	1	2	0	-	0	25	2	10	4	18	1	5	0	2	0	-	0	63	8
Maryland	-	0	1	0	3	1	26	5	22	1	187	22	410	29	655	52	2054	411	3358	521
Massachusetts	1	0	4	1	1	0	30	7	32	6	76	26	257	80	4	1	64	3	469	124
Michigan	-	0	5	2	39	15	2	0	13	1	19	9	4	0	4	1	23	13	109	41
Minnesota	1	1	1	0	2	1	2	0	4	0	1	0	-	0	4	0	-	0	15	2
Mississippi	-	0	-	0	-	0	5	0	4	0	2	0	3	0	3	0	2	0	19	0
Missouri	-	0	5	0	-	0	12	0	8	0	103	52	462	63	10	0	5	1	605	116
Montana	-	0	1	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	1	0
Nebraska	-	0	1	1	-	0	-	0	1	0	1	0	-	0	-	0	-	0	3	1
Nevada	-	0	-	0	-	0	4	0	1	0	-	0	-	0	-	0	-	0	5	0
New Hampshire	-	0	-	0	-	0	1	0	8	3	6	0	2	0	2	1	4	0	23	4
New Jersey	-	0	-	0	1	0	1464	128	7668	305	14625	287	27287	602	25720	259	42412	2184	119177	3765
New Mexico	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
New York	-	0	10	1	29	5	314	24	6692	232	11690	374	17917	756	43961	312	26405	1697	107018	3401
North Carolina	-	0	-	0	-	0	3	0	3	1	-	0	-	0	-	0	-	0	6	1
North Dakota	-	0	-	0	-	0	4	0	4	0	1	0	-	0	-	0	-	0	9	0
Ohio	61	20	363	52	144	12	306	25	180	19	727	130	1782	357	2767	225	5050	850	11380	1690
Oklahoma	-	0	2	0	1	0	-	0	6	0	2	0	3	0	3	0	3	0	20	0
Oregon	-	0	-	0	-	0	-	0	1	1	-	0	1	1	-	0	-	0	2	2
Pennsylvania	2	1	16	4	4	1	47	5	67	9	46	7	373	10	1256	18	2961	149	4772	204
Rhode Island	-	0	-	0	-	0	2	1	1	0	30	1	4	3	1	0	-	0	38	5
South Carolina	-	0	-	0	-	0	-	0	1	0	2	0	-	0	-	0	-	0	3	0
South Dakota	-	0	-	0	-	0	-	0	2	0	-	0	-	0	-	0	-	0	2	0
Tennessee	-	0	1	0	-	0	6	1	10	0	43	3	22	1	10	0	96	46	188	51
Texas	-	0	1	0	1	0	2	0	5	0	-	0	5	0	1	0	-	0	15	0
Utah	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
Vermont	-	0	-	0	-	0	2	1	6	2	3	1	3	0	5	0	-	0	19	4
Virginia	1	0	1	0	-	0	11	0	20	3	112	4	388	32	346	1	237	22	1116	62
Washington	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
West Virginia	-	0	3	0	8	1	-	0	5	0	7	3	807	6	1203	58	2424	521	4457	589
Wisconsin	-	0	4	0	6	4	4	1	15	1	6	2	8	5	5	0	11	7	59	20
Wyoming	-	0	-	0	-	0	-	0	1	0	-	0	-	0	-	0	-	0	1	0
Dis. of Columbia	1	0	10	1	7	1	8	0	7	0	11	0	34	5	105	2	100	2	283	11
Canada	-	0	-	0	-	0	1	0	1	0	-	0	-	0	1	0	1	0	4	0
States not recorded	-	0	-	0	-	0	-	0	-	0	-	0	77	0	-	0	-	0	77	0
TOTAL VERTICILLIUM		24		67		44		211		773		1451		2621		1780		9396		16365
TOTAL SPECIMENS	77		462		269		2447		16956		37985		62288		87185		101085		308694	

The fungus has been isolated from American and English elms, although other species may be affected by the disease. May and Liming found it on red elm (Ulmus fulva).

As a single limb or branch of an elm tree infected by Verticillium may suffer sudden foliage collapse due to a flaccid state of the leaves, accompanied by a loss of turgor in the shoot, the disease may properly be termed a wilt. The twigs and branches of a diseased tree, when given a slanting cut or cross-sectioned, reveal a complete or partially solid or dotted brown ring in the sapwood, similar to that found in the Dutch elm disease. If the bark is peeled back, the discoloration appears as a longitudinal discontinuous streaking, another similarity to the Dutch elm disease.

The disease has been found more commonly on young trees, although older ones with a diameter breast high of 48 inches have been observed affected.

Verticillium wilt, like Dutch elm disease, cannot be identified by symptoms alone. The wood submitted for diagnosis has been cultured upon a 2 percent potato-sucrose agar of pH 5.5 to 6.4, and incubated at a temperature of 26°C. This temperature is probably too high for best results, but is satisfactory for Ceratostomella ulmi, the fungus in which the Department has been primarily interested. Verticillium may be identified on this medium in 4 days in many cases, but it sometimes requires as long as 14 to 21 days to appear. The fungus first appears as a white fluffy mycelial growth on the chip of wood. By the time the colony is 10 days old, it slowly changes color - first to a gray, then to a grayish green, and finally to a black.

A study of hundreds of plate cultures from stocks collected from Indiana, Illinois, New York, New Jersey, Connecticut, Ohio, and Maryland indicates that the typical colony is applanate to slightly pulvinate. All cultures studied produced pseudo-sclerotia.

(Dutch Elm Disease Control Office, Bureau of Entomology and Plant Quarantine, and Division of Forest Pathology, Bureau of Plant Industry).

SCLEROTINIA SCLEROTIORUM ON CALCEOLARIA

H. H. Whetzel and A. W. Dimock

A number of diseased calceolarias were recently received from a commercial grower in western New York. The foliage of the plants was wilted and some of the leaves showed irregular necrotic areas extending out into the lamina from the petiole. The stems were found to be dry and punky and the pith was replaced by cottony mycelium and numerous black

sclerotia of the Sclerotinia sclerotiorum type. A statement by the grower to the effect that infections seemed to initiate largely at points where branches had been cut back suggested that the fungus was fruiting in the greenhouse. On visiting the establishment, the writers found that this was indeed the case. Sclerotia had fallen down between the pots and become lodged in the layer of cinders and soil which covered the bottoms of the raised benches. Within this moist substrate the sclerotia were germinating and typical S. sclerotiorum apothecia were being formed at the surface of the cinder layer. Apothecial formation, as well as infection of the plants, had undoubtedly been favored by an extended period of excessively humid and cool weather. The writers estimate that at least 75 percent of the grower's original stock of several thousand plants were diseased at the time of their visit or had previously been discarded because of the disease.

Attention is called to the fact that the fungus was apparently not brought in with the potting soil, but was being carried along as sclerotia in the soil and cinder substrate upon which the pots were placed. Recognition of this fact was basic to the formulation of control recommendations.

(Department of Plant Pathology, Cornell University).

DID BOTRYTIS ACTUALLY CAUSE GLADIOLUS BLIGHT IN FLORIDA?

W. B. Tisdale

In the May 1, 1940 issue of the Plant Disease Reporter (24, No. 8:159-161. 1940) appeared an article entitled "Epiphytotic of Botrytis Blight on Gladiolus in Florida" by A. W. Dimock. The author's proof of the cause of this epiphytotic is as follows:

"Consideration of the facts that Botrytis was isolated in pure culture in nearly all attempts and that climatic conditions were optimum for rapid development of botrytis blight, leaves little doubt that the epiphytotic was caused by one or more strains of Botrytis."

Dimock's description of the disease indicates that he was considering the same one which began to appear in Florida early in March and continued to develop with more or less severity in commercial plantings of all ages and varieties throughout the State until the end of April. During this period several plant pathologists and members of other departments of the Florida Experiment Station had the disease under observation and so far they have obtained no information to confirm Dimock's conclusion or to prove that any other factor is the direct cause of the trouble. This brief paper is offered to report certain observations of Florida workers which indicate the need for further investigations of the disease before accepting Botrytis as its direct cause.

Florida plant pathologists have not found Botrytis constantly associated with the disease in the field. Indeed, most of the small yellowish spots with brown centers have not only failed to yield any organism in culture but have shown no evidence of a fungus in microscopic mounts. In this respect the disease agrees with that described by Moore (Bul. 117, Min. Agr. and Fisheries, Gt. Britain), but none of the forms of corm injury described by Moore were observed. Larger leaf lesions which occurred on some plants but apparently were not advanced stages of the numerous small spots yielded Alternaria, Botrytis, Fusarium, and Stemphylium. Pure cultures of these organisms, however, have failed to produce infection under artificial conditions. Also, McCulloch reported that specimens sent by growers to the Bureau of Plant Industry showed no pathogenic bacteria or fungi.

During a period of one week or ten days during the latter part of March growers reported that the flowers developed a soft rot in storage and transit and to some extent in the fields. According to their reports before and after that period, this condition did not develop even though the leaves and flowers were affected with the small specks. Botrytis spores were produced abundantly on the decayed blossoms and were distributed to other parts of plants contained in the package while in transit. However, the small yellowish specks with dark centers on the foliage enlarged very little in transit in the State and Botrytis was not found sporulating on them.

The possibility of insects being the cause of or predisposing agents of the disease was investigated by the entomologist. The gladiolus thrips (Taeniothrips simplex Morrison) was the insect most prevalent during the period. At first some growers thought the disease might have been caused by the poison bait spray used for controlling the thrips but it was equally prevalent where none of this material had been used. Also, the disease occurred in some fields during the early part of the season before any thrips were found in them.

Growers who had been following a regular spray program for disease control reported that they could see no difference in severity of the disease between sprayed and non-sprayed fields. They also reported that they could see no difference in effectiveness among different forms of copper fungicides that were used. In one locality the disease was reported to have appeared first in certain fields planted with corms known to have been infected with Fusarium rot, but adjacent fields planted with healthy corms soon showed the specking in equal severity. The disease appeared on all varieties of gladiolus regardless of soil type, although there was a difference in severity manifest among varieties. No signs of root injury were observed that could be correlated with the disease. Soil chemists reported no appreciable difference in severity of the disease between the higher sandier soils and the low muck and marl soils. Naturally, these soil types carried a different percentage of moisture as well as other differences. Records of rainfall

from localities where gladioli were grown show that in most cases there was an excess of rainfall and cloudy days. This was accompanied by a mean temperature that was below normal.

Thus, there was a combination of several factors existing during the prevalence of the disease that rarely obtains in the State, but so far there is insufficient evidence to show what influence this had on the occurrence of the gladiolus blight.

If the Botrytis reported by Dimock is responsible for all the damage to gladioli, it can only be explained on the basis of an unusual strain of the organism or a combination of favorable environmental factors which our investigators have not been able to approximate.

(University of Florida).

BACTERIAL RING ROT OF POTATO IN THE KANSAS CROP

L. E. Melchers

Since bacterial ring rot [Phytomonas sepedonica] is a new disease in the potato crop, we were not definitely aware of its presence in 1939, although at the end of the crop season we suspected its presence. Excessive heat damage at digging time in 1939 would have made the identification of ring rot somewhat confusing, especially since no field inspections for its presence in the plants in the Kaw Valley were made. Fortified with a better knowledge of the symptoms of this disease, careful watch was kept for its presence in the 1940 crop.

Kansas does not grow any of its own seed potatoes, most of them being shipped in from North Dakota and Minnesota. Since ring rot occurs in many of the seed-producing States, it seemed likely that Kansas would get its share of infected seed, especially since many of the Kansas growers are using non-certified seed.

There are a few general statements that may be made concerning potato ring rot in Kansas this year. (1) Some of the seed lots purchased by growers were examined early in spring and found to have definite evidence of infection. (2) Ring rot has been found in a number of fields in the Kaw Valley. (3) We believe the losses this year were less than might have been expected for the Kaw Valley. It is difficult to estimate the exact loss, but several staff members who have inspected various fields believe that the entire loss to the crop was probably not over 1 or 2 percent. (4) The Kansas Agricultural Experiment Station recommended the use of the acid corrosive sublimate treatment after the seed was cut, for those lots of seed that were suspected of having ring rot. Records

thus far obtained in commercial plantings where this recommendation was followed and in experimental plots where the acid corrosive sublimate treatment was used after cutting the seed indicate definitely that this treatment does help to control the spread of this disease.

(5) The worst infected seed brought into Kansas was commercial or uncertified seed. Generally speaking, certified seed was remarkably free of ring rot.

The above is a preliminary statement of the situation as it occurred in Kansas in 1940.

(Kansas Agricultural Experiment Station).

POTATO RING ROT AT HASTINGS, FLORIDA, IN 1940

A. H. Eddins

Only three lots of certified seed containing a trace to 1 percent ring rot [Phytomonas sepedonica] were found this year. One of these lots containing 1 percent ring rot was not accepted by the purchaser and was sold for table stock in Jacksonville, Florida. The other two lots with a trace of ring rot were planted at Hastings. A field count near time of digging showed that 5 percent of the plants were affected in a field planted with one lot and 1 percent were affected in a field planted with the other lot.

Approximately 1000 acres were planted with "selected" Katahdin seed reported to contain a trace of ring rot prior to its purchase. It is probable that this trace was detected in the fields in Maine at the first inspection, at which time it was rejected for certification. If this were the case, it is likely that the fields contained more than a trace at time of digging. Some of the fields planted with this seed at Hastings were inspected at various times, and from 3 to 12 percent of the plants were found to be affected with ring rot. It is probable that infection exceeded the percentages recorded, since the author did not have time to inspect many of the fields. The percentages recorded were based on inspections made from one to three weeks before the potatoes were dug. Sufficient time elapsed after inspection for the disease to increase and affect a much higher percentage of plants than those noted. It is quite probable that the disease caused a loss of at least 5 percent of the crop planted with this selected seed. This estimate is based upon possible loss of tubers destroyed by the rot in the field and infected tubers discarded at the packing plants.

(Hastings Laboratory, Florida Agricultural Experiment Station).

POTATO DISEASES IN THE HASTINGS SECTION OF FLORIDA IN 1940

A. H. Eddins

The exceptionally cold weather of the 1940 season was generally unfavorable for the development of diseases. An exception was rhizoctonia (Rhizoctonia solani), which was favored by the delayed emergence due to low temperatures. Even rhizoctonia, however, was less important than usual and caused little loss, estimated at 1 percent from reduced yield plus an equal loss from lowered quality. Spaulding Rose was seriously affected. Many hills in most fields produced aerial tubers and tubers with protuberances. This type of injury was rare in Katahdin.

Late blight (Phytophthora infestans), which is usually very important, caused only a trace of loss. Phenomenally cold weather throughout the season, especially in the first half, with many clear bright days, apparently prevented its development. There was sufficient rainfall but only a few cloudy days, with little foggy weather and light dews.

Only one field was noticed with more than an occasional tuber infected with common scab (Actinomyces scabies). In some parts of this field, which was on infested soil at Arcadia, 225 miles south of Hastings, 75 percent of the tubers were infected.

Early blight (Alternaria solani), southern wilt (Sclerotium rolfsii), sclerotinia rot (Sclerotinia sclerotiorum), and fusarium seedpiece rot (Fusarium oxysporum), caused no more than a trace of loss. apiece.

The weather was entirely too cold for brown rot (Bacterium [Phytomonas] solanacearum) to develop except in late crops. The maximum infection observed was only 13 percent in a field in which 100 percent of the plants were affected in 1939. Reduction in yield for the section averaged a trace, and tuber rot 1 percent.

Blackleg (Bacillus carotovorus) [Erwinia phytophthora], although more prevalent than in 1939, was less important than usual. Most of the damage from this disease occurred in Katahdin fields in the latter part of the growing season. Average loss was 1 percent, of which half was from reduced yield.

The weather was both too cold and too dry during the digging season for the development of lenticel rot (Bacillus carotovorus) [Erwinia carotovora], and loss was negligible.

Virus diseases were less important than usual. Losses from rugose mosaic and from leafroll averaged 0.5 percent, and from spindle tuber a trace. Losses from rugose mosaic were limited almost entirely

to fields planted in Spaulding Rose, Bliss, and White Rose. The Katahdin and Sebago varieties are very resistant to this disease.

Hair sprout (cause unknown) caused the usual trace of loss. This trouble is found mostly in the Earlaine variety.

(Hastings Laboratory, Florida Agricultural Experiment Station).

REPORTS ON POTATO LATE BLIGHT

NEW YORK (from Weekly News Letter, July 22):

Late Blight Now Present in Up-State Potato Fields: Late blight [Phytophthora infestans] of potatoes has now been found in up-State New York. An outbreak was first located in an experimental field and in the sample seed plot near Varna in Tompkins County on July 15. Since then it has been found near Victory in Cayuga County. In all probability it now occurs in many fields throughout Western and Central New York.

The weather since planting has been favorable for a build-up of this blight and we have been expecting for the past two weeks to find it. An epiphytotic of blight is certain to occur, with a subsequent heavy loss, if the weather continues favorable. In any case, the disease will cause more or less damage during the remainder of the season.

Growers of potatoes will need to be very thorough in spraying or dusting if they wish to save their crop. (M. F. Barrus).

Erie County: On July 18 and July 19, late blight was found spreading in two potato fields in the southern part of Erie County. The infection noted on the eighteenth occurred in a well-shaded isolated area but that observed on the nineteenth was very much under field conditions and the infections noted were secondary. This means that late blight can probably be found in other sections of the southern part of the county (C. F. Crowe).

Late Blight on Long Island: Potato late blight is very widespread in Suffolk County, the infection being more general than I have ever seen it before. In general, it has caused no serious damage yet, and thorough spraying and dusting seems to be holding it well. (W. G. Been).

WEST VIRGINIA: In the high altitudes, weather has been especially favorable for the late blight of potato, but, although I have been expecting to find or hear of the presence of this disease, it has not yet shown up. (J. G. Leach, July 13. West Virginia University).

TOMATO DISEASES IN NORTHEAST TEXAS IN 1940

G. E. Altstatt, P. A. Young, and A. L. Harrison

On June 20 and 21, 1940, a trip was made covering the tomato-producing area of northeast Texas, including Van Zandt, Wood, Red River, and Bowie Counties. At that time, this area was producing marketable green wrap fruit and most packing sheds had been in operation about a week. Tomato fields and packing sheds at each shipping point were visited and the plants and fruits examined. There had recently been abundant rain in most of this area. The diseases encountered were as follows:

Early blight (Alternaria solani): Early blight was present throughout the area. In most cases damage was confined to the lower leaves, but in a few fields, more serious damage was observed.

Bacterial spot (Bacterium vesicatorium) [Phytomonas vesicatoria]: This disease was generally widespread, although in some fields none was found. It varied from a trace to 100 percent infection, and spoiled most of the fruit in a few fields.

Bacterial canker (Aplanobacter michiganense)[Phytomonas michiganensis]: Canker was found on the fruits in two locations, and in the stems only in one field. Damage by canker amounted to a trace.

Bacterial speck (Bacterium punctulans)[probably = Phytomonas tomato, according to Bergey et al., ed. 5, p. 180. 1939]: What appears to be bacterial speck was found in 3 fields; in one field, 25 percent of the fruit was damaged. This is apparently the first report of this disease in Texas.

Fusarium wilt (Fusarium [bulbigenum] lycopersici): Fusarium wilt was rare in northeast Texas. Since this is a relatively new tomato-producing area and most of the growers are using resistant varieties, it may not spread as rapidly as it has in other localities.

Southern blight (Sclerotium rolfsii): Generally, southern blight was not very destructive as only occasional plants were attacked. One field, however, showed nearly 25 percent of the plants killed. In another field, a few diseased plants were noted, while in an adjacent piece of ground from which Irish potatoes had been recently harvested, S. rolfsii was found growing profusely from new potatoes and stems left in the field.

Curly top (virus): Curly top is common in northeastern Texas this year, as occasional plants with curly top were found in every field visited. No insect vector was found on the affected plants. Apparently this is the first time that curly top has been common in East Texas. Five tomato plants with curly top symptoms were sent from Jacksonville, Texas to Dr. Eubanks Carsner at Riverside, California, where Dr. Wallace transmitted the curly top virus from all five of the plants. A preliminary description of tomato curly top in East Texas was given in the Reporter (24: 228. June 15, 1940.).

Fern leaf, bushy stunt or bunchy top, and mosaic (virus): These virus diseases were rare. Mosaic was affecting about 50 percent of the plants in one field.

Blossom-end rot: Blossom-end rot was found in all fields, but not in excessive amounts.

Soil rot (Rhizoctonia solani) and bacterial sack rot were found occasionally. The sack rot was unusually common in a field which had been flooded for several days.

Water soak (undet.): Packers were culling out all tomatoes with soil stain which occurred after the recent showers. They called the blemish "water-soak."

Root knot (Heterodera marioni) was observed on plants in one field.

Fruit pox (undet.) was found in one field.

Core rot was reported by some shippers as causing losses, but none was observed in the course of this survey.

(Texas Agricultural Experiment Station, College Station).

THE 1939 TOMATO DISEASE SITUATION IN UTAH

H. Loran Blood and Roy M. Christianson

The tomato disease survey used as the basis of this report was made at the beginning of the 1939 harvest season in cooperation with canning company fieldmen. The relation of seed and plant source to the occurrence of the three major diseases--i.e., curly top, verticillium wilt, and bacterial canker--was given special attention. General observations were made on the occurrence of fusarium wilt, blossom-end rot, mosaic, and psyllid yellows.

Losses calculated on the basis of the reduction in yield caused by disease probably were more nearly correct in 1939 than in the average year, because the demand for canned tomato products quickly absorbed the supply at the prices asked. Orders were received by many companies that could not be filled. Indications are that a much larger pack could have been sold at the prevailing wholesale price had it been available. The farmer's share of the loss was probably about $150,000. During the survey 217 fields selected from all tomato-growing districts comprising 775 of the 6,200 acres under cultivation were examined. The survey data are summarized in Table 1.

Curly Top

Less curly top (virus) appeared in the State in 1939 than in any single year for the past decade. The survey records indicate that slightly less than 2 percent of the plants in the State were infected. Many fields were entirely free, a condition rarely seen in the Great Basin area. Very few fields were observed with more than 3 percent of the plants diseased.

Approximately 15 percent of the plants in one field in the foothills of the Wasatch Range east of Kaysville were diseased. Such heavy infections are rarely observed in that district even in years when the disease develops in epidemic form. Some local condition contributing to the over-wintering of the insect vector, the beet leafhopper (Eutettix tenellus Baker), near that field must have been responsible for such an unusual amount.

The greatest disease development occurred, as usual, in those counties nearest the leafhopper-breeding areas. Utah County with large breeding areas directly to the west had a record of 2.14 percent curly top. Weber and Box Elder Counties with the Promontory Point and Little Mountain breeding areas directly to the west had records of 2.08 and 2.35 percent curly top respectively. Davis County, located eastward and farther removed from the breeding areas, had a record of only 1.64 percent curly top.

Leafhopper population appeared to be low on the breeding areas contributing to the population in the tomato-growing districts. No migration occurred from the large leafhopper-breeding area in the southern part of the State. Good crops of tomatoes with not over a 5 percent loss from curly top were grown at Hurricane and Santa Clara, Utah. Such a low curly-top infection is very unusual for those districts as they are located in the southern leafhopper-breeding area. Small numbers of leafhoppers migrated into the cultivated districts from the breeding areas north and south of the Great Salt Lake 1/, but the insects were not highly viruliferous and little damage was done.

1/ Blood, H. L. The Utah Tomato Disease Situation in 1935. The United States Department of Agriculture. Plant Disease Reporter 20: 96-102. 1936. (Mimeographed)

Table 1. Distribution of bacterial canker, verticillium wilt, and curly top of tomatoes in Utah, 1939.

County	District	Number of fields surveyed	Number of acres surveyed	Average percent infection per acre: Bacterial canker	Verticillium wilt	Curly top
Utah	Dixon-Payson	2	6	0	30	1
	Salem-Spanish Fork	16	49	.51	16.73	1.86
	Mapleton	10	24	0	8.12	1.48
	Springville	3	3.5	0	22.86	1
	Orem	1	1	0	20	1
	Vineyard	7	38	.50	24.21	2.61
	Lakeview	6	21	.09	24.28	3.28
Davis	Kaysville	10	31	7.11	26.61	3.92
	Layton	20	115	7.18	34.30	1.65
	Clearfield	24	104	2.51	49.51	1.11
	Syracuse	15	60.25	16.98	39.58	1.65
	West Point	4	9.5	0	41.05	1.42
	Clinton	6	48	1.88	71.88	1.21
	South Weber	9	11.5	14.30	27.39	2.22
Weber	Roy	7	35	8.88	49.51	1.51
	Hooper	9	23	5.02	46.96	3.39
	Wasatch (Ogden)	18	45.5	12.81	37.58	2.24
	North Ogden	12	22	3.92	8.98	1.56
	Plains City	15	40	15.35	8.90	1.91
Box Elder	Perry	4	4.75	21.68	6.84	2.21
	North Brigham-Merrill	4	25	14.48	25.40	2.56
	Corrine	7	34	1.06	21.76	2.47
	Bear River City	3	6	1.33	11.67	1.67
	Burt-Honeyville	5	18	5.05	36.94	2.11
Summary - by Counties						
	Utah	45	142.5	.32	19.12	2.14
	Davis	88	379.25	6.81	43.40	1.64
	Weber	61	165.50	10.33	30.67	2.08
	Box Elder	23	87.75	6.84	24.41	2.35

Total number of fields surveyed 217
Total number of acres surveyed 775
Average percent bacterial canker per acre for all fields surveyed 6.38
Average percent verticillium wilt per acre for all fields surveyed 34.07
Average percent curly top per acre for all fields surveyed . . . 1.91

The South Weber district at the mouth of Weber Canyon, as usual, was more severely damaged than many districts farther west and nearer the breeding areas. Air currents from the northwest, west, and southwest converge at South Weber as they pass up the Canyon, and the insects may have been concentrated in that area by these converging currents. In general, the relationship of the appearance of curly top to the insect-breeding areas was less pronounced in 1939 than in years of greater disease development.

Verticillium Wilt

Approximately 34 percent of the plants of the State were infected with verticillium wilt (Verticillium albo-atrum Reinke & Berth.) before the picking season began. The average wilt-infected tomato plant will yield about one-third less than the average healthy plant under the same conditions. Upon that basis a reduction in yield of 11.3 percent for the State was attributed to the disease.

Evidence that districts where tomatoes are cultivated most intensively and have been grown for the longest time are most heavily infested with the disease is increasing. New districts opened up under recently completed reclamation projects offer opportunities for tomato production under conditions relatively free from verticillium wilt.

The source of seed had no apparent influence on the development of verticillium wilt in the fields. Approximately 31 percent of the plants grown from locally produced commercial seed and set in 56 fields developed wilt, 34 percent of the plants grown from imported commercial seed and set in 121 fields, and 33 percent of the plants grown from seed saved by individual farmers and set in 29 fields. The differences in those percentages are not significant.

The source of plants appeared to have little effect, except under certain special situations, upon the subsequent development of verticillium wilt. Approximately 38.4 percent of the locally grown plants set in 98 fields developed verticillium wilt, while 33.5 percent of plants grown in the Moapa Valley, Nevada, and set in 97 fields developed the disease.

Differences in disease development did appear in locally grown plants from different sources. Tomato plants were grown for commercial use in 2 greenhouses in the State. Approximately 6.5 percent of the plants from one of the greenhouses developed the disease when set in 8 fields in 2 districts showing an average disease development of 26.6 and 38.5 percent respectively. Approximately 8.5 percent of the plants from the other greenhouse developed the disease when set in 9 fields located in a district with an average disease development of 8.9 percent. The disease appeared in approximately 28.67 percent of the plants grown in an open field cold frame and set into 3 fields located in a district with

an average of 27.4 percent wilt, and in 33.4 percent of the plants in all the fields in all the districts set with plants grown in local seed beds. Bacterial canker obscured the wilt picture in most of the fields set with plants grown in many of the open field cold frames. The numbers of fields yielding data are so small that the data are not very significant, but the results indicate a phase of the problem that should be considered.

Bacterial Canker

The development of bacterial canker (Aplanobacter michiganense E.F.S.) [Phytomonas michiganensis (Erw. Smith) Bergey et al.] in 1939 was slightly but perhaps not significantly less than for the past few years. Approximately 6.4 percent of the plants surveyed in the State were infected with bacterial canker compared with 7.6 percent for the previous year.

Evidence from survey data is accumulating to the effect that such factors as plant and seed sources are very important in the development and control of the bacterial canker disease. The seed that was used for Utah tomato plant stocks was of three kinds; (1) imported commercial seed, (2) locally produced commercial seed, and (3) privately produced local seed. Bacterial canker developed in approximately 3.4 percent of the plants grown from imported seed and set in 120 fields, 9 percent from locally produced commercial seed in 56 fields, and 13.75 percent from privately selected seed in 29 fields.

These figures imply that seed should be imported for use in Utah. Such figures may be misleading. Approximately 62 percent of the fields using imported seed stock were set with plants grown in the Moapa Valley, while only 33 percent of the fields using locally produced commercial seed stock were set with plants from that source. None of the fields using privately selected seed stock were set with Moapa Valley plants. All of the plants used in the State that were not grown in the Moapa Valley were grown in local seed beds, many of which were heavily contaminated with the bacterial canker pathogen. Approximately 13 percent of the home-grown plants set in 109 fields developed canker, while only .4 percent of the Moapa Valley grown plants set in 97 fields developed the disease. It is evident that the local seed beds carried a heavy contamination and were responsible for the wide dissemination of the disease in the State.

Plants from the 2 greenhouses mentioned above developed 1.13 and 1.68 percent bacterial canker, respectively, in the field. Plants grown by the operator of the first greenhouse in an open field cold frame from seed of the same stock developed 56.6 percent canker in 8 fields.

Observation and preliminary experimentation indicate that manure beds are better and safer for plant production than electrically heated beds or cold frames. Plants from manure beds developed 8 percent disease, whereas plants from cold frames developed over 13 percent.

The percentage of bacterial canker that appeared in fields set with plants grown in the Moapa Valley and in the greenhouses was probably greater than it should have been, because farmers who used plants from those sources frequently obtained plants from neighbors' plant beds or from local commercial beds for resetting. Bacterial canker appearing in the plants from those contaminated sources would wrongfully be attributed to infection from the Moapa Valley or from the greenhouse in which they were grown.

The survey data indicate that the local commercial and private seed beds function as the principal source of inoculum for the disease appearing in the Utah tomato fields. Plant growers are beginning to realize this and are making a concerted effort to adopt more sanitary measures for the control of the disease in the seed beds. Last year their efforts in that direction were of little avail. Some field seed beds changed to new locations, and otherwise cleaned up according to instructions, still produced infected plants. Perhaps effective measures for the control of the disease in the seed beds are not known. Some research should be done to determine the most effective sanitary methods that could be applied for the control of the seed bed phase of the disease.

Other Tomato Diseases

Fusarium wilt (Fusarium lycopersici Sacc.)[F. bulbigenum lycopersici Brushi) Wr. & Reinking]: Fusarium wilt was observed on a few plants in Davis and Utah Counties. Losses from the disease are not significant.

Blossom-end rot (physiological): The losses from blossom end rot were minor. Relatively few plants produced fruit that developed this condition and losses from the disease were negligible.

Mosaic (virus): Yellow and green mosaics were observed in many fields in all parts of the State. The diseases were most prevalent in the Davis County area. Streak, a manifestation of a combination of viruses, was not observed. Losses resulting from the group of mosaic diseases have been estimated at approximately 1 percent.

Psyllid yellows (insect toxin): Psyllid yellows was not observed or reported in the State.

(Division of Fruit and Vegetable Crops and Diseases, U. S. Bureau of Plant Industry).

DOWNY MILDEW AND BULB NEMATODE ON ONIONS IN NEW YORK

Allan G. Newhall

The first infections of onion downy mildew (Peronospora destructor) in commercial onion fields were observed July 15 in the Canastota area. Mildew was probably present a week before this in a few isolated areas and is now pretty generally spread over most of the acreage. Losses to a few acres sown with seed may reach nearly 100 percent, but much of the 1500-acre crop planted with sets will probably pull through and make a fair crop unless the weather continues cool.

This spring the disease was 10 days earlier than last year in developing on home plantings of top sets, but 2 weeks later than in the big blight year of 1938. However, onions were planted nearly 2 weeks later than usual this spring, and weather has been very favorable for sporulation the past two months. The absence of mildew last year is not only due to its late start in the spring but to the drouth of July and August. A similar drouth this year might still save most of the onion crop.

Two facts again stand out this season. The home plantings of perennial top set onions on upland farms and village gardens are the only known annual sources of primary inoculum in this State. The commercial crop grown from sets is far enough advanced by June each year to become infected from air-borne conidia which are most abundant at that time. The fungus multiplies with great rapidity on these early planted fields of sets and passes on from them to the late crop. Until all top sets are removed from certain counties, mildew will continue to plague the onion grower in seasons favorable for sporulation and spore dispersal.

Areas treated for the control of the bulb nematode (Ditylenchus dipsaci) show very little infection, but enough of the disease (onion bloat) could be found to indicate that eradication has not yet been complete.

(New York State College of Agriculture. July 18).

GARLIC RUST IN CALIFORNIA

M. W. Gardner

Garlic rust, identified by Dr. E. B. Mains, University of Michigan, as Puccinia porri (Sow.) Wint., has been prevalent on the late or main crop in the Salinas and San Juan Valleys in California this year. In fields visited on July 3, traces of infection were found on the early

variety, mature at that date, and light to heavy infection in many fields of the main crop. In the opinion of growers, the yield in some fields will be considerably reduced by the rust. In some fields the infection was uniform; in others there were definite areas of heavy infection visible from a distance.

Dr. C. E. Yarwood found a few telial pustules on the dead leaves of the early garlic.

Two onion fields near the garlic fields were examined and no rust infection was found. Mr. D. G. Milbrath reports that garlic rust was found in 1934 in the Salinas Valley by G. L. Stout and H. A. Hunt, who also observed that onions adjacent to the rusted garlic were not infected.

(University of California).

DOWNY MILDEW IN MASSACHUSETTS TOBACCO FIELDS

O. C. Boyd

A summary at this time will help to explain or account for the unusually pronounced field-infection phase of downy mildew [Peronospora tabacina] this year. Downy mildew was first observed in Massachusetts beds around May 22 to 25. The prolonged period of cool, wet weather of May 21 to 29 and May 31, favored its increase, where present, in beds that were not treated or treated effectively. However, the warm, dry period of June 1 to 9 appeared to check development in infected beds and to delay its appearance in others. The remainder of the month, on the other hand, was abnormally cool and damp for that time of year, thus extending the lateness of an already late growing season.

In fact, it was surprising that downy mildew, which is notably favored by cool, wet weather, did not assume epidemic form generally. As it was, the disease became really destructive in relatively few beds, even though the latter were not treated. Yet it was observed in many beds, though not prominent, during the latter half of June when the bulk of the crop was being set out. Then, as in 1933, the disease was still more pronounced and widespread, although not particularly destructive during the restocking season, that is, during the last week of June and the first week of July. By July 5 many growers had either hoed up their beds or destroyed plants with formaldehyde.

Throughout the first week of July downy mildew spots appeared on the lower leaves of the earliest set fields, both shade and Havana seed tobacco. It continued to develop, in size and number of spots, during the second week of July, many of the spots showing fresh spore formation. In fact, on July 17, several fields of Havana seed tobacco visited

showed an abundance of large, recently developed, leaf spots heavily coated with live spores. Infections were decidedly heavier on the oldest and the medium-aged plantings, while the youngest fields showed little or no development above the lowermost leaves. On July 13 in the oldest fields, the lower 7 to 8 leaves of the 12-leaf plants were spotted, and the lower 4 leaves of the 8-leaf plants in later fields. At this time, a survey revealed the presence of the disease in about 85 to 90 percent of the fields.

An examination of several fields in Hadley and Sunderland on July 20 revealed only a single leaf with what was considered an active downy-mildew spot, that is, with live spores present, and that occurred on a small rostock plant in a tent. It is believed that the hot period of July 17 to 21 has greatly inactivated if not killed out the disease organism in the leaf spots. The maximum daily temperatures for those days were 85, 88, 83, and 87°F.; and the minimum temperatures, 67, 64, 66, and 77°F., respectively. It was rather surprising that the hot period of July 7 to 10, with maximum daily temperatures of 85, 88, 89, and 86°F., failed to "burn-out" the leaf infections, although the minimum temperatures for those dates were somewhat lower than those for the former period, namely, 50, 56, 59, and 59°F.

Summary: 1. Downy mildew was more widely spread in tobacco beds during the month of June than was generally suspected, although actually destructive in comparatively few beds.

2. Instead of being confined mostly to sections of fields near the plant beds as in 1939, this year the disease developed generally over the fields and could be readily found on the lowermost leaves, thus indicating that it came to the field with the plants.

3. This year, when the infected plants were set in the field during the last two weeks of June, the weather was such as to favor its continued development, whereas in some past seasons it was too warm or too dry or both for development.

4. There was evidence that both methods of fumigating plant beds were ineffective at times, mostly because of low nightly temperatures and leaky bed covers in the case of paradichlorobenzene and because of leaky bed covers and long intervals between treatments in the case of benzol.

5. The most pronounced lesson from this year's experience is this: The grower can not feel secure against losses from downy mildew unless he treats his beds regularly and properly with paradichlorobenzene or with benzol, throughout the entire setting and replanting season. His own infected bed is likely to be a much more dangerous source of the disease for the crop in the field than spore drift from neighboring

infected beds. Also, it is advisable for each grower to control the disease in his own beds in order that he may have healthy plants to set out at the proper time, whereas if he loses his bed and is compelled to obtain plants from his neighbor, he will likely have to set his fields late and after the disease has become widespread in the neighbor's bed.

(Massachusetts State College. July 23).

REPORTS ON WHEAT SCAB

PENNSYLVANIA: Wheat scab [Gibberella zeae] was more prevalent in Pennsylvania than for many years. Nearly every field had some scab. The highest infection found was 50 percent. Scab in practically every case was much more destructive on wheat fields planted after corn. (R. S. Kirby, Pennsylvania State College. July 23).

WEST VIRGINIA: A few days ago I returned from a trip through the southern part of the State, where I had the opportunity of observing disease development in a number of grain fields. There is a very severe epidemic of wheat scab throughout the State. The severity of infection varies from very light to almost 100 percent. Invariably, the heaviest infection was in fields planted on corn stubble. Perithecia were abundant on the corn stalks, and in many cases the stalks were pink with the conidia of the pathogen. It was the most striking demonstration of the influence of this rotation on the severity of scab that I have ever seen.

The weather conditions have been particularly favorable for such diseases as scab and anthracnose. (J. G. Leach, July 13. West Virginia University).

INDIANA: Wheat scab was the most severe that has been observed during the past decade. Weather conditions at flowering time and several days after were almost ideal for scab infection and development. So far as can be learned, the very severe damage has been limited to wheat sown in corn stalk ground, as is commonly practiced in this State. Many reports of severe damage have been received. In one field a count showed the complete blasting of 30 percent of the florets. In addition to the damage on corn stalk land, general infection in other fields was much more conspicuous than usual. (Ralph M. Caldwell, July 23. Purdue University Agricultural Experiment Station).

WHEAT LOOSE SMUT AND OTHER CEREAL SMUTS

CEREAL SMUTS IN WEST VIRGINIA: There was considerable loose smut in both wheat and barley, and several fields of barley with 15 or 20 percent covered smut were observed, but bunt of wheat was conspicuous by its absence. [Ustilago tritici, U. nuda, U. hordei, Tilletia spp.]. (J. G. Leach, July 13. West Virginia University).

WHEAT LOOSE SMUT INCREASING IN INDIANA: Loose smut of wheat has been increasing rapidly during the past 3 years in Indiana as it has done in many other wheat-growing areas. Wheat varieties grown are predominantly susceptible, but in most years past, losses have been so small as to attract little consideration. This year much complaint has been heard on the apparent increased smut susceptibility of old standard varieties grown in the State for a good many years. Also, two new releases in this State, Purdue No. 1 and Wabash, have shown high susceptibility. It is likely that an estimate of 5 percent smutted heads would not be excessive in the State. (Ralph M. Caldwell, July 23. Purdue University Agricultural Experiment Station).

WHEAT LOOSE SMUT AND OAT SMUT ABUNDANT IN KANSAS: Loose smut again proved to be the most abundant disease of winter wheat in Kansas. The disease still is increasing and was present in every field visited this year. Some fields had as much as 20 percent and infections of 2 to 5 percent were common. All varieties except Kawvale seem to be infected, although loose smut was most abundant in Chiefkan, Clarkan, Early Blackhull, and Turkey.

Smut of oats is abundant in some localities in the extreme eastern part of the State. Infections of 25 percent have been noted and 5 percent of smutted panicles are frequently encountered. (C. O. Johnston, June 22. Cereal Courier 32: 92. July 10).

CROWN RUST OF OATS IN ILLINOIS

G. H. Boewe

Data on the prevalence and intensity of the 1940 oats crown rust [Puccinia coronata] attack have now been taken in fields in 9 counties representing the southern two-thirds of Illinois. The observations have extended as far north as Woodford County. In all but 3 of the fields examined the oats crop was past the milk stage and in the northern part of the region combines were being operated in some fields.

Although no data have yet been taken in the northern third of the State, the data from the central and southern thirds indicate that crown rust is this year much less severe than usual. In fact, during 18 years of record, crown rust attack has been as mild in only 4 previous years, 1925, 1929, 1934, and 1936. The leaf area occupied by rust pustules was less in 3 years, 1925, 1929, and 1936, and the number of culms with infected leaves and sheaths was less in 1936, 1934, and 1925. Although prevalence in 1934 was less than in 1940, the severity was greater, as .98 percent of the leaf area was destroyed.

Year	Percent of diseased culms	Percent of leaf area diseased
1940	35.5	0.6
1939	96.5	22.0
1938	95.5	16.0
1937	83.4	3.8
1936	3.1	0.04
1935	67.7	8.5
1934	12.8	0.98
1933	43.1	1.5
1932	85.7	0.8
1931	63.5	1.0
1929	27.6	0.02
1928	42.9	2.3
1927	88.6	25.9
1926	70.4	9.9
1925	14.8	0.18
1924	79.9	14.8
1923	93.5	41.2
1922	78.7	37.6

(Section of Applied Botany and Plant Pathology, Illinois State Natural History Survey, Urbana).

REPORTS ON WHEAT RUSTS

STEM AND LEAF RUSTS IN INDIANA: Stem rust [Puccinia graminis] again, as in 1937, has caused serious damage to the winter wheat crop in Indiana. It is apparent that wind-borne inoculum was carried into the State considerably earlier than June 1. Secondary spread from primary infection was abundant in certain parts of southern Indiana on June 8. Well developed primary infection was found in the northern part on June 13. Moisture conditions have been ideal for rust development but temperatures have been low enough to retard it. Most of the wheat crop of the State was fully a week later than average. Limited observation and reports and samples of grain from various parts of the State indicate that damage varies from almost total to relatively small losses. It is

probable that most severe damage has occurred in the southern part of the State. However, appreciable damage has been done in the northern half.

Leaf rust [P. rubigo-vera tritici] of wheat is estimated to have done relatively little damage, although it became quite abundant immediately before ripening of the crop. No oversummering or overwintering of inoculum was observed in the Lafayette area. It appears that most of the infection in the State resulted from an introduction of spores from a distance, which arrived too late to produce an early and therefore severe epidemic. (Ralph M. Caldwell, July 23. Purdue University Agricultural Experiment Station).

STEM RUST IN KANSAS: Conditions during June have been favorable for the development of cereal crops in most parts of Kansas. Rainfall has been near or slightly below normal and temperatures have not been abnormally high. Winter wheat has made very satisfactory progress in most parts of the State and harvest now is under way in many localities. The maturity of the crop is very spotted, however, and many fields of late wheat can be found in nearly all sections. There is a large area of extremely late wheat in south-central counties. Large portions of such fields were found to be in the boot to flowering stages on June 8--fully three weeks behind normal.

Stem rust made its appearance in the State late in May and has gradually increased during June. Most of the extremely late fields will be destroyed or severely damaged by stem rust provided they escape heat damage. Severe damage in late but otherwise good fields already has been reported from several widely scattered localities as far north as the central part of the State. (C. O. Johnston, June 22. Cereal Courier 32: 92. July 10).

OTHER REPORTS ON CEREAL DISEASES

CERCOSPORELLA FOOT ROT OF WHEAT IN IDAHO: Nezperce, Lewis, and Idaho Counties in Idaho were visited with Dr. C. S. Holton on June 13. Cercosporella foot rot (Cercosporella herpotrichoides) was spotted and severe in several fields. On the Lewiston Flats, where foot rot was severe in 1934, only slight to moderate damage was observed. There was nearly 100 percent prevalence in some fields; however, dry weather arrived too soon for a serious epidemic. There was some lodging of the wheat due to Cercosporella. In Idaho County, in the vicinity of Cottonwood, very little foot rot was found. In Lewis County, in the vicinity of Nezperce, several fields of Rex wheat were severely damaged by foot rot infection. Some fields showed 30 to 40 percent loss. There was approximately 100 percent prevalence, with culms badly tangled, off-color, and with reduced head size.

Foot rot is scattered in the Palouse area. Only small areas of infection occur in any one field. The rod-row nursery varietal test in the Agronomy plots at Moscow has been severely damaged by Cercosporella. There is some doubt as to whether it will be worth harvesting.

Mr. C. A. Suneson and Dr. C. S. Holton report a severe epidemic on the High Prairie section in Washington. (W. M. Bever, June 27. Cereal Courier 32: 94. July 10).

GLUME BLOTCH OF WHEAT AND ANTHRACNOSE ON RYE IN WEST VIRGINIA: There also was a very heavy epidemic of Septoria glume blotch [S. nodorum] on wheat. Several fields of rye rather severely affected with anthracnose [Colletotrichum graminicola] were observed. (J. G. Leach, July 13. West Virginia University).

BACTERIAL WILT OF SWEET CORN IN NEW YORK (from Weekly News Letter for dates indicated): In Nassau County (Long Island), according to Orson S. Cannon, "Counts in fields of corn range from 0.5 to 5 percent wilt [Phytomonas stewarti], which is much below average for this time of year." (July 22). Wm. J. Clark reported that he had observed what seemed to be slight infections of wilt on July 2 but that, so far, no wilt has appeared in any commercial planting in Rockland County (July 8; July 15).

PEACH LEAF CURL IN ILLINOIS

G. H. Boewe

Data showing the incidence of peach leaf curl, Exoascus deformans [Taphrina deformans], have been obtained by examining 90 plantings of various sizes in 25 counties in the southern half of the State. These data are given in the accompanying table. The field work was done at various times during the period beginning May 1 and ending June 4. Except in the orchards examined in Pulaski and Massac Counties, the disease had developed to full epidemic proportions in each orchard at the time the examinations were made. Development of the disease was delayed this year because of the lateness of the season.

The amount of leaf curl varied considerably from orchard to orchard on unsprayed trees. There appears to be no adequate explanation for the absence of leaf curl or for the very light infection found in certain unsprayed orchards. In the main, however, trees receiving a full sulfur spray schedule last summer had no or very little leaf curl, and none was observed on trees receiving a dormant fungicide.

Incidence of peach leaf curl, Exoascus deformans, in Illinois in 1940.

County	Control used	Number of trees in orchard	Percentage of trees with infection	Percentage of leaves infected on diseased trees	Average percentage of leaves diseased in orchard
Bond	Oil & Bordeaux	800	0	0	0
	Oil & Bordeaux	600	0	0	0
	None	1	100	31.4	31.4
Clark	None	15	100	62.2	62.2
Clay	None	1,000	0	0	0
	Not determined	1,600	0	0	0
Cumberland	None	12	100	1.5	1.5
	None	150	100	T	T
	None	50	0	0	0
	None	150	100	T	T
Edwards	None	40	10	T	T
	None	40	40	T	T
	None	70	50	T	T
Fayette	None	600	0	0	0
	None	600	95	0.37	0.25
Franklin	None	300	100	17.8	17.8
	Not determined	700	0	0	0
	Not determined	2,500	0	0	0
Gallatin	None for several yrs.	600	100	17.3	17.3
Jackson	None	400	4	T	T
	Oil & Bordeaux	5,000	0	0	0
	None	13	20	T	T
	Not determined	500	0	0	0
	Not determined	600	0	0	0
Jasper	Not determined	800	100	T	T
	None	5	100	1.4	1.4
	None	160	90	4.7	0.42
Jefferson	None	100	100	0.3	0.3
	Not determined	50	80	T	T
	Not determined	2,000	4	T	T
	None	400	12	T	T
	Oil & Bordeaux	3,000	0	0	0
	None	200	65	T	T
Johnson	None	100	100	13.2	13.2
	Not determined	1,000	0	0	0
	None	1,200	0	0	0
Lawrence	None	50	30	T	T
	Not determined	400	0	0	0
	Not determined	150	0	0	0
	None	6	66.67	2	1.33
Madison	None	15	0	0	0
	None	5	0	0	0

Incidence of peach leaf curl, Exoascus deformans, in Illinois in 1940 (Cont'd).

County	Control used	Number of trees in orchard	Percentage of trees in orchard	Percentage of leaves infected on diseased trees	Average percentage of leaves diseased in orchard
Marion	None	13	100	3.3	3.3
	None	50	40	T	T
	Lime-sulfur	1,100	0	0	0
	Lime-sulfur	1,000	0	0	0
	None	25	20	T	T
Massac	Lime-sulfur	300	0	0	0
	None	250	100	7.9	7.9
	Not determined	300	0	0	0
	Oil & Bordeaux	245	0	0	0
	Oil & Bordeaux	850	0	0	0
	None	760	100	14.5	14.5
	Oil & Bordeaux	1,800	0	0	0
Perry	None	1,000	0	0	0
	None	5,500	0	0	0
	None	2,000	0	0	0
Pulaski	Not determined	350	0	0	0
	None	2,000	0	0	0
	Not determined	50	20	T	T
	Oil & Bordeaux	2,000	0	0	0
	Lime-sulfur	250	0	0	0
	None	7	100	2.0	2.0
Richland	Not determined	600	70	T	T
	None	6	0	0	0
	None	5	100	8	8
Saline	None	40	0	0	0
	None	150	80	T	T
	None	400	55	T	T
	None	50	0	0	0
Union	None	16	90	T	0
	None	150	100	2.6	2.6
	None	50	100	1.5	1.5
	None	500	5	1.0	0.05
	None	280	0	0	0
	Not determined	1,100	5	T	T
	None	1,000	96	T	T
Washington	Not determined	450	0	0	0
	Not determined	600	0	0	0
	None - oil only	200	20	T	T
Wayne	None	900	100	3	3
	None	200	100	9.4	9.4
White	None	100	100	11.7	11.7
	Not determined	3,000	0	0	0
	None	5	80	T	0
Williamson	Not determined	400	0	0	0
	None	26	100	9.3	9.3
	None	200	50	T	T
	None	500	100	1.3	1.3
	None	9	77.8	0.5	0.38

(Section of Applied Botany and Plant Pathology, Illinois Natural History Survey, Urbana).

BRIEF NOTES ON PLANT DISEASES

PHLOEM NECROSIS DESTRUCTIVE IN WEST VIRGINIA: I have not had the opportunity of making an extensive survey of the elm disease situation in the Ohio valley, but in passing through Charleston and Parkersburg last week, I could tell that it was continuing to kill off elm trees in large numbers. Phloem necrosis [virus] is indeed a destructive disease, and if it continues to spread as rapidly as it has during the past three or four years, it is going to equal or exceed the Dutch elm disease in destructiveness. The smaller European elm bark beetles continue to multiply in the trees killed by phloem necrosis, and these beetles are approaching the point where they will be doing considerable damage in their own right. If the Dutch elm disease fungus ever becomes established in this region, it will spread with alarming rapidity. (J. G. Leach, July 13. West Virginia University).

BACTERIAL SPOT OF PEACH IN NORTHEAST TEXAS: In connection with the tomato disease survey (p. 291), bacterial spot [Phytomonas pruni] of peach was found in a large orchard bordering the highway. The disease was widespread and spots were abundant on fruit and leaves. This disease has been reported in previous years as causing losses of 15 to 40 percent. (G. E. Altstatt, P. A. Young, and A. L. Harrison. Texas Agricultural Experiment Station, College Station).

FIRE BLIGHT IN WEST VIRGINIA: Fire blight [Erwinia amylovora] of apples and pears was prevalent throughout West Virginia this year. It was much more destructive than last year. (J. G. Leach, July 13. West Virginia University).